IN THE CLAIMS:

Amend the following claims:

1. (Cancelled)

2. (Currently amended) A perpendicular magnetic recording medium, comprising:

a soft magnetic underlayer formed on a substrate;

a non-magnetic amorphous metal layer containing Ni, which is formed on the soft magnetic underlayer; and

a perpendicular magnetic recording layer formed on the non-magnetic amorphous metal layer containing Ni,

wherein a film thickness of said non-magnetic layer is from 2 nm to 10 nm.

3. (Previously presented) The perpendicular magnetic recording medium according to claim 2, wherein said non-magnetic amorphous metal layer containing Ni contains Zr.

4. (Original) The perpendicular magnetic recording medium according to claim 3, wherein said non-magnetic amorphous metal layer further contains at least one of Nb and Ta.

5. (Currently amended) A perpendicular magnetic recording medium, comprising:

a soft magnetic underlayer having α-Fe nano-crystals, which is formed on a substrate, ~~and~~

a non-magnetic intermediate layer formed on the soft magnetic underlayer, and

a perpendicular magnetic recording layer formed on the non-magnetic intermediate layer,

wherein said soft magnetic underlayer is formed as an amorphous film by sputtering, and formed as nano-crystalline film by annealing.

~~a perpendicular magnetic recording layer formed on the soft magnetic underlayer via a non-magnetic intermediate layer.~~

6. (Original) The perpendicular magnetic recording medium according to claim 5, wherein in said soft magnetic underlayer, a nano-crystal contrast is observed in a transmission electron microscopic image, which is measured by allowing an electron beam to be incident in a perpendicular direction to a film surface, and in a transmission electron microscopic image, which is measured by allowing an electron beam to be incident in a parallel direction to a film surface.

7. (Original) The perpendicular magnetic recording medium according to claim 5, wherein in said soft magnetic underlayer, diffraction peaks 110, 200 and 211 of α-Fe appear on a thin-film X-ray diffraction profile, which is measured by fixing an X-ray incident angle θ at 2 degrees.

8. (Original) The perpendicular magnetic recording medium according to claim 5, wherein in said soft magnetic underlayer, diffraction rings 110, 200 and 211 of α-Fe are observed in an electron diffraction image, which is measured by allowing an electron beam to be incident in a perpendicular direction to a film surface, and in an electron diffraction image, which is measured by allowing an electron beam to be incident in a parallel direction to a film surface.

9. (Original) The perpendicular magnetic recording medium according to claim 5, wherein said soft magnetic underlayer contains Fe as a first element, at least one of C and N as a second element and at least one kind of element selected from Ta, Hf, Nb, Ti and Zr as a third element.

10. (Cancelled)

11. (Currently amended) A magnetic storage apparatus, comprising:

a perpendicular magnetic recording medium according to claim 2, having a soft magnetic underlayer, a non-magnetic amorphous metal layer containing Ni formed on the soft magnetic underlayer, and a perpendicular magnetic recording layer formed on the non-magnetic amorphous metal layer containing Ni;

a driver for driving the perpendicular magnetic recording medium in a recording direction;

a magnetic head consisting of a recording section and a reproduction section;

means for allowing said magnetic head to have a relative movement for said perpendicular magnetic recording medium; and

recording-reproduction processing means for performing signal input to said magnetic head and reproduction of output signal from the magnetic head,

wherein said magnetic head reproduction section is constituted of a high-sensitive layer utilizing any one of a magnetoresistive effect and a tunneling magnetoresistive effect.

12. (Currently amended) A magnetic storage apparatus, comprising:

a soft magnetic underlayer having α -Fe nano-crystals;

a perpendicular magnetic recording medium <u>according to the claim 5,</u> having a perpendicular magnetic recording layer, which is formed on the soft magnetic underlayer via a non-magnetic intermediate layer;

a driver for driving the perpendicular magnetic recording medium in a recording direction;

a magnetic head consisting of a recording section and a reproduction section;

means for allowing said magnetic head to have a relative movement for said perpendicular magnetic recording medium; and

recording-reproduction processing means for performing signal input to said magnetic head and reproduction of output signal from the magnetic head,

wherein said magnetic head reproduction section is constituted of a high-sensitive layer utilizing any one of a magnetoresistive effect and a tunneling magnetoresistive effect.

13. (Previously presented) The perpendicular magnetic recording medium according to claim 5, wherein said nano-crystals is ferromagnetic.

14. (Previously presented) The perpendicular magnetic recording medium according to claim 2, wherein the perpendicular magnetic recording layer is directly on the ~~non-metal~~ <u>non-magnetic</u> layer.

15. (New) A perpendicular magnetic recording medium, comprising:

a soft magnetic underlayer having α -Fe nano-crystals, which is formed on a substrate,

a non-magnetic amorphous metal layer containing Ni, which is formed on the soft magnetic underlayer; and

a perpendicular magnetic recording layer formed on the non-magnetic amorphous metal layer containing Ni,

wherein said soft magnetic underlayer is formed as an amorphous film by sputtering, and formed as nano-crystalline film by annealing.

16. (New) A perpendicular magnetic recording medium according to the claim 15,

wherein a film thickness of said non-magnetic layer is from 2 nm to 10 nm.

17. (New) A perpendicular magnetic recording medium according to the claim 15,

wherein said soft magnetic underlayer is containing Fe, Ta and C,

wherein said non-magnetic amorphous metal layer is containing Ni, Ta and Zr.